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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/809,135	03/25/2004	Tzu-Chen Lee	58994US002	7723

32692 7590 06/21/2006

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EXAMINER	
VU, HUNG K	

ART UNIT	PAPER NUMBER
2811	

DATE MAILED: 06/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/809,135	LEE ET AL.	
	Examiner	Art Unit	
	Hung Vu	2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 January 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) *19-27* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *10/25/04,07/20/05*.
4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Embodiment 1, claims 1-18, in the telephone call on 01/04/06 is acknowledged.

Claims 19-27 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected Invention, there being no allowable generic or linking claim.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. (Optical Materials 21, of record) in view of Zhou et al. (Advanced Functional Materials 2001, of record).

Lee et al. discloses, as shown in Figure 1, a Schottky diode comprising:

a polycrystalline organic semiconductor layer;

a rectifying contact on a first surface of the organic semiconductor layer;

an ohmic contact.

Lee et al. does not disclose a doped buffer layer of an amorphous doped organic semiconductor formed between the organic semiconductor layer and the ohmic contact. However, Zhou et al. discloses a diode comprising a doped buffer layer of an amorphous doped organic semiconductor

formed between an emission layer and an ohmic contact. Note Figures 2 and 3 of Zhou et al.. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the diode of Lee et al. comprising a doped buffer layer of an amorphous doped organic semiconductor, such as taught by Zhou et al. in order to improve the breakdown voltage and to prevent spiking of the ohmic contact through the organic semiconductor.

Regarding claims 2 and 12, Lee et al. and Zhou et al. disclose the organic semiconductor layer is chosen from a group consisting of pentacene.

Regarding claims 4-5 and 13-14, Lee et al. and Zhou et al. disclose the organic semiconductor has a thickness of 2000 angstroms (within the range of 1500 and 10,000 angstroms).

Regarding claims 6 and 15, Lee et al. and Zhou et al. disclose the organic semiconductor is MTDATA.

Regarding claims 7 and 16, Lee et al. and Zhou et al. disclose the MTDATA is doped with F4-TCNQ.

Regarding claims 8 and 17, Lee et al. and Zhou et al. disclose the MTDATA is doped with 3% F4-TCNQ (within the range of 3-20%).

Regarding claims 9 and 18, although Lee et al. and Zhou et al. do not teach the doping of the MTDATA, as that claimed by Applicants, however, it would have been obvious to one having ordinary skill in the art at the time the invention was made to form the MTDATA having a desired doping, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 10, Lee et al. discloses, as shown in Figure 1, a Schottky diode comprising:

a substrate (not shown);

an ohmic contact with a first surface in contact with a first surface of the substrate;

a polycrystalline organic semiconductor layer;

a rectifying contact with a first surface in contact with the organic semiconductor layer.

Lee et al. does not disclose a doped buffer layer of an amorphous doped organic semiconductor formed between the organic semiconductor layer and the ohmic contact. However, Zhou et al. discloses a diode comprising a doped buffer layer of an amorphous doped organic semiconductor formed between an emission layer and an ohmic contact. Note Figures 2 and 3 of Zhou et al.. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the diode of Lee et al. comprising a doped buffer layer of an amorphous doped organic semiconductor, such as taught by Zhou et al. in order to improve the breakdown voltage and to prevent spiking of the ohmic contact through the organic semiconductor.

Regarding claim 11, Lee et al. and Zhou et al. disclose all of the claimed limitations except material of the organic semiconductor layer. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the device of Lee et al. and Zhou et al. having the materials as that claimed by Applicant, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Conclusion

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung Vu whose telephone number is (571) 272-1666. The examiner can normally be reached on Tuesday to Friday 6:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on (571) 272 - 1732. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Vu

May 1, 2006

Hung Vu

Primary Examiner